

In the Claims:

1. (amended) A method which comprises polymerizing an olefin in the presence of a clathrochelate which comprises:

- (a) a transition metal ion; and
- (b) a macropolycyclic ligand that encapsulates the transition metal ion;

wherein the macropolycyclic ligand has at least three macropolycyclic fragments that share at least two capping atoms, at least one of the capping atoms ~~of the macropolycyclic ligand~~ is a Group 3-10 transition metal or a Group 13 atom, ^{is coordinated to} and the transition metal ion ~~coordinates~~ five or more nitrogen, phosphorus, oxygen, or sulfur atoms of the macropolycyclic ligand.

2. (original) The method of claim 1 wherein the ligand is selected from the group consisting of polyaza-, polyazathio-, polythio-, polyoxo-, polyoxothio-, polyazaoxo-, and polyazaoxothiomaobicyclic ligands.

3. (original) The method of claim 1 wherein the clathrochelate is a tris(dioximate).

4. (amended) The method of claim 1 wherein the both capping atoms of ~~the macropolycyclic ligand~~ are Group 4 transition metals.

5. (original) The method of claim 1 further comprising an activator.

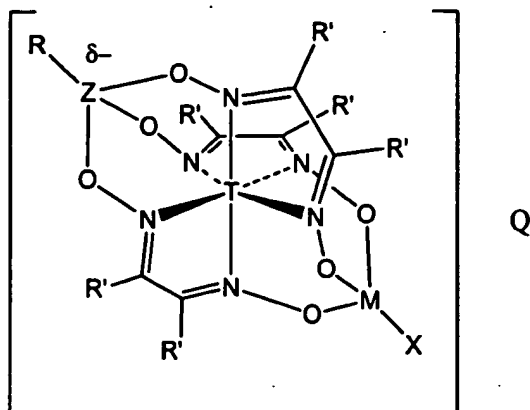
6. (amended) The method of claim 1 wherein the both capping atoms of ~~the macropolycyclic ligand~~ are Group 13 atoms, and the clathrochelate is used in combination with an olefin polymerization catalyst.

7. (original) The method of claim 6 wherein the polymerization is performed in the presence of an alkylaluminum compound.

8. (original) The method of claim 1 wherein the transition metal ion is selected from the group consisting of Fe^{2+} and Co^{3+} .

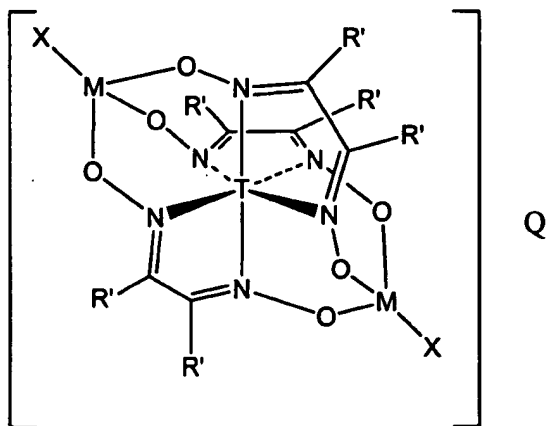
9. (original) The method of claim 1 wherein the Group 13 atom is boron, aluminum, or a combination of these.

10. (original) The method of claim 1 wherein the clathrochelate has the structure:



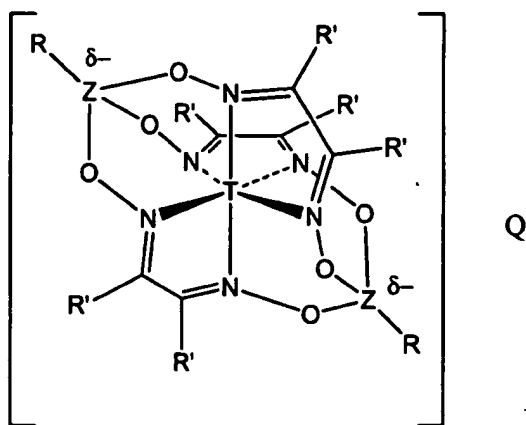
wherein T is a transition metal ion, M is a Group 4 transition metal, X is a halide, Z is boron or aluminum, R is a halide, alkyl, aryl, or aralkyl group, each R' is independently hydrogen or an alkyl, aryl, or aralkyl group or hydrocarbonyl radicals joined to form a five or six-membered ring, and Q is one or more counterions that balance the overall charge on the clathrochelate.

11. (original) The method of claim 4 wherein the clathrochelate has the structure:



wherein T is a transition metal ion, M is a Group 4 transition metal, X is a halide, each R' is independently hydrogen or an alkyl, aryl, or aralkyl group or hydrocarbyl radicals joined to form a five or six-membered ring, and Q is one or more counterions that balance the overall charge on the clathrochelate.

12. (original) The method of claim 6 wherein the clathrochelate has the structure:



wherein T is a transition metal ion, Z is boron or aluminum, R is a halide, alkyl, aryl, or aralkyl group, each R' is independently hydrogen or an alkyl, aryl, or aralkyl group or hydrocarbyl radicals joined to form a five or six-membered ring, and Q is one or more counterions that balance the overall charge on the clathrochelate.

13. (amended) A catalyst system useful for polymerizing olefins, said catalyst system comprising an activator and a clathrochelate, wherein the clathrochelate comprises:

(a) a transition metal ion; and

(b) a macropolycyclic ligand that encapsulates the transition metal ion;

wherein the macropolycyclic ligand has at least three macropolycyclic fragments that share at least two capping atoms, at least one of the capping atoms of the macropolycyclic ligand is a Group 3-10 transition metal, and the transition metal ion ^{is coordinated to} coordinates five or more nitrogen, phosphorus, oxygen, or sulfur atoms of the macropolycyclic ligand.

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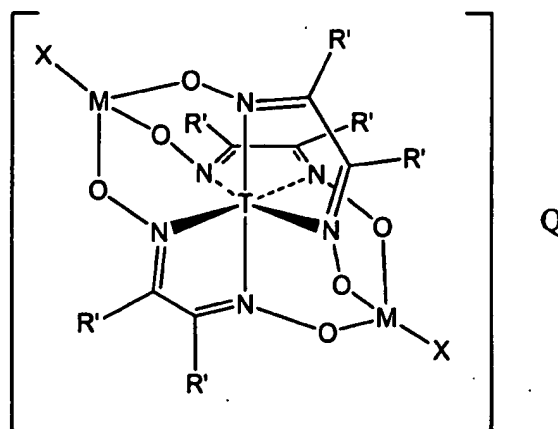
14. (original) The catalyst system of claim 13 wherein the clathrochelate is a tris(dioximate).

15. (original) The catalyst system of claim 13 wherein the transition metal ion is selected from the group consisting of Fe^{2+} and Co^{3+} .

16. (original) The catalyst system of claim 13 wherein the activator is selected from the group consisting of alumoxanes, alkylaluminum compounds, aluminoborates, organoboranes, ionic borates, and ionic aluminates.

17. (amended) The catalyst system of claim 13 wherein at least one of the capping atoms of the macropolycyclic ligand is zirconium.

18. (original) The catalyst system of claim 13 wherein the clathrochelate has the structure:



wherein T is a transition metal ion, M is a Group 4 transition metal, X is a halide, each R' is independently hydrogen or an alkyl, aryl, or aralkyl group or hydrocarbyl radicals joined to form a five or six-membered ring, and Q is one or more counterions that balance the overall charge on the clathrochelate.

19. (amended) An activator for olefin polymerization reactions, said activator comprising an alkylaluminum compound and a clathrochelate, wherein the clathrochelate comprises:

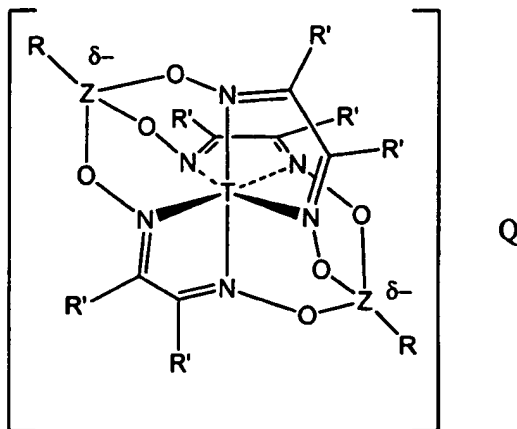
(a) a transition metal ion; and

(b) a macropolycyclic ligand that encapsulates the transition metal ion;

wherein the macropolycyclic ligand has at least three macropolycyclic fragments that share at least two capping atoms, at least one of the capping atoms of the macropolycyclic ligand is a Group 13 atom, and the transition metal ion coordinates five or more nitrogen, phosphorus, oxygen, or sulfur atoms of the macropolycyclic ligand.

20. (amended) The activator of claim 19 wherein the both capping atoms of the macropolycyclic ligand are Group 13 atoms.

21. (original) The activator of claim 20 ^{wherein the clathrochelate has} ~~having~~ the structure:



wherein T is a transition metal ion, Z is boron or aluminum, R is a halide, alkyl, aryl, or aralkyl group, each R' is independently hydrogen or an alkyl, aryl, or aralkyl group or hydrocarbyl radicals joined to form a five or six-membered ring, and Q is one or more counterions that balance the overall charge on the clathrochelate.